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The Economic Development Potential of the Green Economy

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The Economic Development Potential of the Green Economy

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Abstract

The Economic Development Potential of the Green Economy

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This paper aims to examine the prospects for success for sustainable economic development planning on the local level. The first section provides background on this question, examines how best to define the Green Economy, and discusses the four most important factors influencing its future growth. This includes the current economic landscape and the hopes that have been pinned on sustainable development. The paper then examines the classification issues that have helped shape the nature of the discussion of this subject, and explores the most prominent methods and partnerships currently being designed and utilized in an attempt to stimulate local sustainable development and job growth. Also discussed is the effect that the current political climate is having on government investment in renewable energy and conservation at the federal and state level.

The paper then designates the cities of Oakland, Toledo, and Austin as case studies as a way to illustrate how these efforts are playing out in the current landscape. Each city has been chosen because it is a leader in an influential sustainable economic development strategy that is being pursued by other cities around the country. Given the four factors influencing growth in the Green Economy, the paper evaluates the strengths and weaknesses demonstrated by each approach. Finally, the paper identifies the most important lessons that can be applied to the biggest challenges of local sustainable economic development strategies.

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Chapter 1: Introduction.

1.1. Overview

"For all the debate, speculation, and controversy that has surrounded the hoped-for growth of the so-called "clean" economy and "green jobs" one thing has been in pretty short supply: facts. For all the talk of its alluring promise, the clean or Green Economy remains an enigma, in large part due to the continued absence of standard national definitions and data." (Muro, Rothwell, and Saha, 2011)

One of the hottest and most exciting economic growth and employment creation strategies being pursued by a large number of American cities is seeking to become successful in the Green Economy. These cities tend to covet these jobs because they see them as likely to expand in an economy where many traditional sectors are experiencing recession. In addition, citizens, non-profit groups, and politicians see economic development based on green industries as more sustainable for the city in the long term and as an effective tool through which to address issues of equity, environmental protection, air quality, carbon emissions, and landfill material reduction. In an effort to attract these industries and jobs cities are focusing on a number of different strategies that depend on a wide array of incentives, such as the creation of enterprise zones, subsidized workforce training, and also impose renewable energy portfolio and renewable energy manufacturing.

The question of how a local or civic entity may best promote the Green Economy in a country that lacks a coherent or aggressive policy promoting sustainable economic development is an urgent one. This is especially true given the likelihood that no such policy is forthcoming, and the additional likelihood that without such incentive policy,

traditional methods of producing energy, constructing buildings, and transporting people and goods are likely to retain their market share. In short, the economy of the near future is most likely to resemble the current configuration. An understanding of which sectors of the Green Economy in the United States are more likely to prove profitable and amenable to limited public investment in crucial. This is especially true given the amount of hope various communities are placing on the Green Economy to solve their economic crises.

This paper serves as an examination of the prospects for success of sustainable economic development planning on the local level. The first section of the paper provides background on this question, examines how best to define the Green Economy, and discusses the four most important factors influencing its future growth. I discuss the current economic landscape and the hopes that have been pinned on sustainable development. The paper then examines the classification issues that have helped shape the nature of the discussion of this subject, and explores the most prominent methods and partnerships currently being designed and utilized in an attempt to stimulate local sustainable development and job growth. Also discussed is the effect that the current political climate is having on government investment in renewable energy and conservation at the federal and state level.

The paper then identifies the cities of Oakland, Toledo, and Austin as case studies in order to illustrate how these efforts are playing out in the current landscape. Each city has been chosen because it is a leader in an influential sustainable economic development strategy being pursued by other cities around the country. Each case study chapter first states why each case study is worthy of study and what differentiates it from other efforts. These policies and results are then placed in the context of the city's history. In addition, the central motivating factors animating each strategy are examined and delineated in order to provide crucial context. Taken together, an analysis of the successes and failures of each case study city provides evidence illustrating which approaches are yielding the most beneficial current results and which are likely to be the most successful in the near future.

Each case study presents the particular strategy being pursued and attempts to isolate and describe what makes each notable and instructive. The specific local elements and programs are described, and evidence of success or failure is presented. The paper then attempts to analyze the strengths and weaknesses associated with the specific elements of each approach. Finally, the paper examines the context influencing the strategy's success or failure, such as the effect that international competition has on a strategy based on manufacturing renewable energy components. This context is key to understanding why some sorts of strategies are more likely than others to achieve the stated aims of creating local employment and economic benefit.

The final section of the paper concludes with an evaluation of the strengths and weaknesses of the growth strategies illustrated by the three case study cities. This professional report is thus an examination of the most important issues faced by cities as they attempt to attract the green or sustainable jobs they believe will help prosper in the face of economic challenges.

To preview this conclusion, I find that while "sexier" aspects of the Green Economy, such as the development of solar and wind power generating capacity are likely to continue to grow at a rate that outpaces the economy in general. It is the more basic areas such as conservation and energy efficiency are more likely to produce tangible job growth for local communities. These jobs are less vulnerable than those that aim to export goods in competition with the international market, where other economies such as China are likely to dominate. In addition, performing such tasks as making homes and businesses more energy efficient is more likely to boost employment that cannot be outsourced and to provide a more stable path to workers seeking advancement. At the same time, the case study city that has focused most of its efforts on renewable energy manufacturing and research and development is experiencing notable success as a result of these efforts. The Green Economy is still a bit of a moving target for cities pursuing it as an economic development strategy.

These same characteristics may make these types of jobs more likely to prosper in the near future given conservative growth projections for the "Green Economy" as defined in this paper. While there are a number of reasons to hope that renewable energy will exponentially rise to contribute 25 or 30% of our energy needs in the near future, or that zero-waste processes will reduce cities landfill material requirements by the hoped for 50 to 75% within 20 or 30 years, these scenarios are overly optimistic. Thus, local planning must take these factors into effect.

1.2. METHODOLOGY

The two major methodologies used to assess the economic development potential of the Green Economy are case study research and a review of existing research. The Introduction discusses the current fervor that has grown up around the Green Economy on the state and national level. The review of literature serves to provide context and understanding to the current knowledge and scholarship surrounding this question. These include two possible future Green Economy growth scenarios based on Bezdek's work, the four major factors most likely to influence future growth, and an effort to analyze the most important conclusions based on these readings. The literature surrounding the vital complicating factor of green job classification problems is also discussed in detail. The specifics of the issues explored by the literature review can be found in the Introduction.

This paper then examines three specific local case studies in order to discuss their sustainable economic development measures, which organizations enact and lead them, and their level of success in creating jobs and growing the Green Economy locally. The cities studied are Oakland, California, Toledo, Ohio, and Austin, Texas. Each of these cities is a leader in its respective Green Economy development strategy. The case study cities were chosen in order to illustrate variations in strategy and motivation in the economic and social composition of cities engaged in these strategies. In addition, each city has a particular social or economic problem they are hoping to address in addition to what they hope will be a measureable and significant economic impact of attracting these industries. The cases should be viewed, therefore, as representing a range of strategies

and motivations rather than as representative of the most widely practiced or best implemented approaches. As a result, conclusions drawn are useful in exploring the claims of advocates of "green development" and in raising issues for further study.

Given the well-established classification difficulties involved in studying the Green Economy, it is not possible to rely on traditional data sources us economic development research; Instead, I look to studies that have proposed methodologies for measuring the composition and size of the Green Economy. These include studies by the Brookings Institute. This paper references a large number of available resources in an attempt to measure each cities progress toward its stated goals.

The end of the paper contains the conclusions resulting from evaluation of the three case studies given the four factors influencing growth in the Green Economy. The paper concludes with the most important lessons that local planning entities may apply to future sustainable economic development discussions. These conclusions are not necessarily representative of the totality of sustainable economic development strategy but are rather insights into the most pertinent factors planners must consider in future planning.

Chapter 2. The Green Economy.

2.1. The Promise of the Green Economy.

In 2008, when Barack Obama was closing in on his historic election as President of the United States, he stressed a few central promises that were to be the centerpieces of his administration. One of these issues was the advancement and development of a domestic Green Economy. This was seen as a sound strategy that would stimulate job growth as well as an important way for the United States to respond to questions of environmental sustainability. In an article in the Independent newspaper from November 2, 2008, then-candidate Obama declared "We'll invest $15 Billion a year over the next decade in renewable energy, creating five million new green jobs that pay well, can't be outsourced and help end our dependence on foreign oil." The appeal of the idea that clean energy could help to kick-start the economy is such that Mr. Obama's Republican opponent, John McCain, has also promised "millions" of green jobs if he wins." (Lean, 2008)

It is easy to see, upon cursory examination, what politicians find so alluring. The promise of the Green Economy is indeed eye opening when one examines some of the economic statistics comparing current Green Economy employment totals and trends to the economy as a whole, as well as projections of future employment and production in green industries. The Green Economy boasts employment growth rates that are the envy of other, more traditional occupations and which prove that the desire of states and cities to capture their share of these jobs is based just as much on the prospect of cold, hard economic gains as they are on environmental or sustainability concerns.

Leaving aside for the moment the considerations and motivations that make the prospect of growing the economy in a more sustainable manner so appealing to so many people, the recent growth of such sectors as renewable or solar energy is startling, especially when compared to the economy as a whole. The Pew Charitable Trust, in its 2009 Clean

Energy Economy report, notes that "between 1997 and pre-recession 2008 clean energy economy jobs—a mix of white- and blue-collar positions, from scientists and engineers to electricians, machinists and teachers—grew by 9.1 percent, while total jobs grew by only 3.7 percent" over this period. (Pew Charitable Trust, 2009). These enviable growth rates are especially alluring when compared to many traditional economic sectors, such as manufacturing, that have suffered greatly during the current recession. The allure of these growth rates is tempered somewhat when one realizes the relatively low total employment and business establishment numbers for sectors contained in the Green Economy. In 2007, the Green Economy was estimated to account for 770,000 jobs in the United States. (Pew Charitable Trust, 2009) Still, the favorability of Green Economy growth indicators, combined with the possibility that projected growth has the potential to help solve pressing environmental, social equity, and energy generation problems, create tremendous excitement.

As we know, Barack Obama was indeed elected as President, and he did end up making significant federal investment in renewable energy and other Green Economy development legislation. In response to the 2008 economic collapse President Obama did require that $90 Billon of the $810 Billion American Recovery and Reinvestment Act (ARRA) of 2009, also commonly known as The Stimulus or The Recovery, be invested in clean energy technology, energy conservation, and manufacturing of renewable energy components and products. This infusion of money is going or has gone to projects such as weatherizing public buildings and constructing advanced battery plants in the industrial Midwest, financing solar electric plants in the Mojave Desert, and training green energy workers. This wide variety of investments illustrates the extremely wide range of what is considered a green job or green investment.

But this huge federal investment has run headlong into the stubborn reality that the market for renewable energy products remains relatively small and turbulent. The administration says that its stimulus investment has saved or created 225,000 jobs in the green energy industry, a small number when compared to the 7.5 million jobs lost after the recession took hold in December of 2007. With nearly 15 million Americans out of

work and the unemployment rate hovering above 9 percent for 18 consecutive months, (BLS, 2011) policymakers desperately hoped to stoke job creation through investment in green jobs. The growth of the Green Economy has also been undercut by the simple economic fact that fossil fuels remain cheaper than much of the energy produced by renewable sources.

We have seen this wave of optimism followed by disillusionment before in our recent history. During the solar energy "boom" of the late 1970's, many believed that increased environmental concern and technological advancement were ready to lead America into a new age of widespread solar power. President Jimmy Carter supported the development of an alternative energy source. However, the recession of the late 70's, combined the election Ronald Reagan, who opposed investment in renewable energy, was considered by many to have short circuited this boom. The solar industry and other alternative energies were not able to achieve the hoped for growth and development. This was a missed opportunity for the United States to expand the alternative energy sector and fundamentally change the nature of our energy provision.

Today, cities use a large number of economic development tools in pursuit of green jobs. One option that is commonly used around the world is the adoption of incentives or regulations mandating the production and use of such staples of the Green Economy as renewable energy. Both Obama administration officials and green energy executives say that what is needed is not just government incentives, but regulation and tax policy that force people and business to turn to renewable energy. Without government mandates shaping how much renewable energy utilities must use to generate electricity, or placing a price on the polluting carbon emitted by fossil fuels, they say, green energy cannot begin to reach its job creation potential. The lack of a binding and coherent national policy on green energy is considered to have retarded the development of the Green Economy as a more viable sector. What this sentiment recognizes is the central importance of thoughtful and proactive planning to achieve these ends, and a realization that the market alone will not lead to the degree of success wished for by politicians, planners, and citizens.

Of course, one of the reasons that "green jobs" are so popular is that each person or group discussing them brings their own perspective on what constitutes a green job or Green Economy to the discussion. An economist or politician may primarily see a way out of the current recession, a recession which seems extremely stubborn and which has been characterized as a jobless recovery. Someone whose emphasis is the development of an economy that is environmentally sustainable in the long-term may see in green jobs a panacea that will allow the capitalist economy and the needs of a stressed planet to peacefully coexist. A scientist might see a future in which new technologies will allow the planet to absorb the exploding population forecast for the future. However, this ambiguity is likely to lead to disappointment and disillusionment if the green jobs phenomenon does not solve these problems to the liking of these various constituents. Green Jobs have become both a catchphrase and a set of diverse goals advocated by urban planners, politicians, environmentalists, and economic development specialists in the United States and throughout the entire world.

The fact that the United States' economy is adding employment and reducing unemployment at a stubbornly slow pace complicates both the growth of the Green Economy and efforts to determine which approaches are successful and to what degree. In the current economy, a green business may fail to grow at anticipated rates or to survive at all, as is the case with many other traditional businesses, which may be attributable to the larger economy and not to the particular company or industry. The widespread lack of confidence in the possibility of growth may also prove particularly detrimental to an industry that requires some leaps of faith in order to gain the traction to succeed on a larger scale.

It is also important to note that sectors such as renewable energy may find the current stubborn recession more detrimental than other industries. One reason is that they require a greater degree of government involvement and partnership in order to develop. This is made more difficult by the fact that the concern over deficits and the corresponding desire to reduce government spending has dominated the political agenda in 2011. Many

voters have been persuaded that government is wasteful, unsustainable, and inefficient, a problematic attitude for any business that depends on either public sector investment or new taxes on environmental pollution in an effort to gain future economic, environmental, and social equity benefit. Persistent economic anxiety may also make society and the political establishment reluctant to support economic investment aimed at future growth and favor measures that provide the most immediate benefit, a paradigm which would tend to favor traditional industries and existing methods of providing energy, disposing of waste, and training our working population.

2.2. CLASSIFICATION PROBLEMS

The simplest and most central question involved in examining green jobs is: what exactly qualifies a job as being green? One dynamic that many experts have used as a framing device is thinking of green jobs as either process-oriented or product-oriented when trying to come up with definitions and employment estimates for evaluation purposes. A product-oriented framework is straightforward and easy to understand. Any job that produces a product that is considered a green product, such as a solar panel or wind turbine, is considered a green job. This method yields the smaller estimate of the Green Economy, estimated at comprising 1% to 2% of the total private business economy in 2007. (Pew Charitable Trust, 2009) A calculation based on the process-oriented methodology attempts to evaluate what portions of an industry are engaged in processes that can be classified as green, renewable, or sustainable. This may be the more accurate measurement in the long term because most people employed in the Green Economy have previously worked in traditional occupations and are now producing existing products of performing existing services in a new way. This framework yields higher estimates of total employment. The difference between these two frameworks ranges from 1.8 million total U.S. jobs under the products definition to 2.4 million jobs under the process definition. (Pew Charitable Trust, 2009)

It is also important to remember that one of the major difficulties in evaluating the success of any sustainable economic development method is the lack of precise evaluation mechanisms, specifically the lack of North American Industry Classification

System (NAICS) codes that specifically measure employment related to the Green Economy. Federal Bureau of Labor Statistics (BLS) databases based on NAICS codes that can be broken down to very specific employment classifications have long been one of the most ubiquitous and useful ways to study employment trends.

The BLS has begun an extensive study project in an attempt to remedy the fact that there are no clear definitions of green industries or jobs. They define green jobs as: "Jobs in businesses that produce goods and provide services that benefit the environment or conserve natural resources. These goods and services are sold to customers, and include research and development, installation, and maintenance services. Green goods and services fall into one or more of five groups: energy from renewable sources, energy efficiency, pollution reduction and removal, greenhouse gas reduction, and recycling and reuse, natural resources conservation, and environmental compliance, education and training, and public awareness." (BLS, 2011)

Another definition is: "Jobs in which workers' duties involve making their establishment's production processes more environmentally friendly or use fewer natural resources. These workers research, develop, or use technologies and practices to lessen the environmental impact of their establishment, or train the establishment's workers or contractors in these technologies and practices. These technologies and practices fall into one or more of four groups: energy from renewable sources, energy efficiency, pollution reduction and removal, greenhouse gas reduction, and recycling and reuse, and natural resources conservation." (BLS, 2011)

The reason that so much attention is being paid to questions of classification is twofold. One, without accurate measuring instruments, evaluation of current trends and future projections of green industry and job growth is haphazard and inaccurate. Two, these definitions impact how planners view green economic development planning and how they evaluate and target green sectors and training initiatives. If making existing industries or processes greener is in fact one of the most fertile grounds in order to facilitate environmental outcomes, is that where the incentives should be concentrated?

Are these types of green activity likely to result in the same level and type of economic growth as new or rapidly expanding alternative technologies such as solar or wind power?

There are additional qualifications that must be made in assessing green prosperity. When considering the goals of increasing employment among races, ages, and classes of workers who face barriers to employment, it is important to remember that many green jobs are not new, or created out of thin air in a fashion unrelated to any previous profession, but are rather adaptations of jobs that already exist. Green economic growth in turn may result in existing occupations experiencing higher rates of growth versus new jobs or occupations, demonstrating again the challenges inherent in attempting to measure green jobs.

How do we assess industries that may have both positive and negative environmental effects, depending on the nature of the particular project they are currently working on? An electrician may have a green job if he is wiring Leadership in Energy and Environmental Design (LEED) certified mix-use development, or may be wiring a traditional suburban housing development far from the city center that may be contributing sprawl, energy waste, and inefficient land use. A public utility can produce energy by burning coal, an environmental negative, as well as encouraging the development of alternative energy in the city by mandating that a certain percentage of the city's electricity be generated by wind or solar power. An industry or occupation can be partly green and partly conventional or "brown."

Next 10 is a California organization that is made up of venture capitalists and important figures in the non-profit and green business worlds. It describes itself as being "focused on innovation and the intersection between the economy, the environment, and quality of life issues." (Next 10, 2011) Its 2011 report *Many Shades of Green* takes another approach at coming up with suitable sustainable employment categories. These are:

- Existing Occupations: The impact of Green Economy activities and technologies is an increase in the employment demand for an existing occupation. However, this impact does not entail significant changes in the work and worker requirements of the occupation. The work context may change, but the tasks themselves do not.
- Enhanced Skills Occupations: The impact of Green Economy activities and technologies result in a significant change to the work and worker requirements of an existing occupational code. This impact may or may not result in an increase in employment demand for the occupation. The essential purposes of the occupation remain the same, but tasks, skills, knowledge, and external elements, such as credentials, have been altered.
- New and Emerging Occupations: The impact of Green Economy activities and technologies is sufficient to create the need for unique work and worker requirements, which results in the generation of a new occupational code. This new occupation could be entirely novel or "born" from an existing occupation. (Next 10, 2011)

There are numerous examples of vexing classifications questions all over the country. The 2010 State New Economy Index considers Vermont to be its Number One state for clean energy consumption, noting that the state gets more than one-third of its energy from green sources. (ITIF, 2010) However, the main reason Vermont is ranked so highly is that it gets over 30% of its energy from nuclear power. (ITIF, 2010) Is nuclear power truly a green technology? Nuclear power is certainly green in its lack of CO2 emissions and use of non-renewable fossil fuel technology, but also produces highly radioactive waste products that must be handled somewhere in a safe and responsible manner. These are the sorts of questions that planners and economists are wrestling with as they attempt to measure the Green Economy.

2.3. THE SCOPE OF THE GREEN ECONOMY AND PROSPECTS FOR GROWTH.

One way to assist in accurate forecasting of possible Green Economy growth scenarios is to choose the most important factors influencing where future growth will likely occur.

This is obviously an area of paramount importance to local planners seeking sustainable industry and job growth, as it will do them little good to invest in an enterprise that may never deliver the results they envision. Professor Michael Oden has written that the four factors that have the greatest influence on the prospects for growth of the Green Economy are:

- Conventional energy and resource prices;
- Pricing and pollution regulations and their market influence;
- Federal and state incentive regulations and research and development spending; and
- International actions and competition. (Oden, 2011)

An examination of these factors leads to the conclusion that conservation efforts should be in the forefront of sustainable economic development planning. While many people envision industries such as solar and wind power when they think of green jobs, renewable energy is only one facet of the market. The development of a sustainable energy economy can take many forms. Conservation and pollution mitigation may lessen in importance as renewable technologies advance, but this seems unlikely, given the rate at which renewable energy generation sources are currently advancing.

There is ample evidence that conservation is in fact not only the largest sector of the Green Economy but the sector likely to produce the greatest amount of employment in the near future. The conservation sector is not as glamorous a pursuit as the alternative energy export industry but is "likely to generate more stable and steady jobs and external benefits (energy savings for utilities and environmental benefits) than wind or solar branch plants. Many communities are seizing on this opportunity." (Fitzgerald, 2009) As noted in the Pew Charitable Trust's report *The Clean Energy Economy*, "65 percent of today's clean energy economy jobs are in the category of Conservation and Pollution Mitigation—a sector that reflects the growing recognition among the public, policy makers and business leaders of the need to recycle waste, conserve water and mitigate emissions of greenhouse gases and other pollutants." (Pew, 2009) Michael Oden also

concludes that "The growth potential of the energy conservation related segment is large, less dependent upon energy prices and aggressive government action."

There is also evidence that policymakers and planners are following this line of thinking in their efforts to stimulate economic growth. "As the market drivers for clean energy react to the economic downturn, state governments are likely to focus on technologies and behaviors that create the most jobs. Dovetailing with this economic need, the Energy Efficiency and Conservation Block Grants will enable states to rapidly—and flexibly—stimulate employment while pursuing energy efficiency strategies". (Dept. of Energy, 2008)

There is an intense interest in renewable energy investment as well. What often draws people to renewable energy as an investment is the high rate of growth. "Clean Energy, Energy Efficiency and Environmentally Friendly Production— are growing at a far faster clip. And about 80 percent of venture capital investments in 2008 were in the sectors of Clean Energy and Energy Efficiency: businesses and jobs working to develop clean, renewable energy." (Pew, 2009) These sectors have also continued to expand their size and market share despite the many challenges they face. As an example, wind power has continued to expand, now accounting for 1.5% of the world's electricity generation, up from 0.1% in 1997. (Sawin, 2009)

The U.S. Department of Energy's 2008 Solar Technologies Market Report confirms that the market for renewable energy continues to improve. As an example, the compound annual growth rate for cutting-edge photovoltaic technology is promising. "Thin-film PV technologies have grown faster than crystalline silicon over the past 5 years, with a 10-year compound annual growth rate of 47% and a 5-year CAGR of 87% for thin-film shipments through 2008. Global thin-film market share increased to 14% in 2008. The United States was the global leader in thin-film production in 2008." (Dept of Energy, 2008) As we will discuss later, this leadership position has been short-lived due to the aggressive investment in renewable energy manufacturing by the Chinese government.

Local economic developers must remember that renewable energy jobs are still a tiny fraction of overall jobs at 1.27 million in 2007, about 1% of total employment. (Pew, 2009) These numbers still compare well with telecommunications (770,000 to 989,000) and other common targets of economic development. Unfortunately, this is still not competitive with "untaxed" or subsidized conventional fuel. This dampening of the market is one more consequence of the negative externalities that our current energy pricing system does not account for. This conundrum is something that local planners considering investing in renewable energy must remember.

The opposite dynamic manifests itself when we consider jobs and industries that are based on conserving energy use, waste production, and landfill use. Conservation involves an more minimal upfront investment and involves avoiding energy generation costs by reducing energy use. Because of the nature of the work involved in making a home or business more energy efficient, these jobs are less vulnerable to foreign competition and can only be performed by local workers. This gives them a competitive and structural advantage when compared with jobs based on the exporting of goods and services to the national or world market.

2.3.1. Conventional Energy and Resource Prices.

There are a number of factors that will influence the future growth of the Green Economy, and in turn influence local economic development prospects based on assumptions of this growth. One crucial question is whether the U.S. economy will raise taxes to account for the negative externalities resulting from our current pricing of conventional energy. A carbon tax or significant cap and trade regime would significantly push up conventional energy prices putting alternative energy on a more even playing field. Given the current deep recession, conservative political climate, and skepticism of government regulation, especially concerning a regressive tax such as a gasoline tax, it seems prudent not to expect these sorts of measures to be adopted in the near future.

Even without these measures, there are analysts who believe that the current energy pricing market will eventually favor the Green Economy. In a speech presented at the 2011 Angelou Economic Austin Economic Forecast on January 24, 2011, Greg Ip, Executive United States Editor for *the Economist*, spoke of the importance of price point to the development of the renewable energy market in the United States and around the world. He expressed his belief that the key to the kind of market expansion that would make renewable energy sources a huge chunk of the energy market is keyed to renewable energies becoming competitively priced, without large-scale government subsidies, green energy mandates, and other normative policies. He believes that conventional energy prices will continue to rise, and that the natural working of the market will then result in the innovations, the entrepreneurial opportunities, and other necessary developments. This view does not take into account, however, the very problematic reluctance to consider the negative externalities of conventional energy such as pollution and carbon dioxide, which is in effect a violation of market economics.

There is evidence that this process of green renewable energy technology becoming cheaper and more widely available is indeed what is taking place. "In this vein, we do have evidence that the price reductions necessary to the market viability of photovoltaic (PV) solar energy components is taking place. In 2008, Global average PV module prices dropped 23% from $4.75/W in 1998 to $3.65/W in 2008…Capacity-weighted, average PV installation costs in the United States decreased 31% from $10.8/W in 1998 to $7.5/W in 2008." (Oden, 2011)

2.3.2. Decisions to influence prices through carbon prices and pollution regulation.

The question of whether the U.S. will or should attempt to account for conventional energy's negative externalities is a crucial one. One significant effort to evaluate this question is made in the *Green Policies, Climate Change, and New Jobs: Separating Fact From Fiction* report published by the Ohio State University Department of Agricultural, Environmental, and Development Economics. Their report argues that efforts to build subsidies for green jobs may reduce carbon emissions, but would also have minimal impact on employment. In addition, they state "although green job growth has been

impressive, its share of employment is too small to have a notable impact on unemployment." (Ohio State, 2010)

This is not a universally shared viewpoint. Many planners and policymakers have promised that by discouraging fossil-fuel intensive industries and encouraging alternative energy industries through subsidies, jobs can be created to alleviate unemployment while promoting energy security and independence from carbon emitting fossil fuels. Illustrating this viewpoint, the U.S. Conference of Mayors recently concluded "the economic advantages of the Green Economy include the macroeconomic benefits of investment in new technologies, greater productivity, improvements in the U.S. balance of trade, and increased real disposable income across the nation. They also include the microeconomic benefits of lower costs of doing business and reduced household energy expenditures. These advantages are manifested in job growth, income growth, and of course, a cleaner environment." (U.S. Conference of Mayors, 2009)

In contrast, opponents of cap and trade and green job subsidies have promised that these policies would actually result in millions of lost jobs, reduced productivity, increased household energy expenditures, and a reduction in income and the competitive advantage of the U.S. These opponents argue that general job growth is due to greater competitiveness rather than green jobs. Many of the claims on both sides of the political spectrum are overstated or arranged in order to achieve a desired conclusion. This dynamic is typical of the discussion of research in our current political arena, and will lead us to make decisions likely to harm the county in the long run. They are counterproductive and unlikely to change.

It is important to remember that existing government action is having an effect. The Department of Energy's 2008 Weatherization and Intergovernmental (WIP) Program Report notes that of the $787 Billion contained in the American Recovery and Reinvestment Act, $16.1 Billion was appropriated for a range of activities related to energy efficiency, including increasing heating and cooling efficiency, sticker building

energy codes, utility incentives, energy audits, and strategic energy planning. (Dept of Energy 2008)

2.3.3. Federal and State Incentive Regulations and Research and Development Spending.

Many academics and researchers point to the necessity of government polices to boost the market, however. There are a number of ways that demand can be stimulated in the renewable energy market. Public policy can critically influence technology and cost development. For instance, governments can subsidize research and development that the private sector deems too risky. At more advanced stages of technology development, governments can act to create markets by indirect means, such as education, or directly through strategies such as mandates (e.g., a Renewable Portfolio Standard (RPS) that compels use of certain green technologies even if they are not currently cost-effective at the margin). In emerging as well as developed markets, governments can impose standards and require certifications to reduce liability and transaction costs.

One important proponent of the need for government leadership in creating the conditions in which a truly sustainable economy can expand is Joan Fitzgerald. In her book *Emerald Cites* Fitzgerald examines the potential of the Green Economy through a number of illustrative prisms. She describes the initial epiphany that inspired her to write this book as a visit she made to Freiburg, Germany. It was during a visit she made there to study the city's efforts to reduce its carbon emissions that she became aware of the potential of green jobs to drive economic development. She is also acutely aware of the central role played by public policy, and bemoans the toxic effects in the United States of the problems posed by our lack of a strong carbon tax and broader energy policy. Through the organizing principle of case studies of what she dubs renewable cities, including Austin, Cleveland, and Toledo, she attempts to measure how much success this movement is experiencing as an economic development strategy. She also notes the limits that our current piece-meal strategy places on domestic development of this sector.

University of Texas Professor Michael Oden is another academic researcher who is attempting to bring exactitude to the economic forecasting of the renewable energy sector. His unpublished paper examines a number of questions crucial to understanding the limitations currently slowing down the growth of the Green Economy and highlight the difficulty that results from the lack of a clear definition of just what fits within the green jobs sector. The final section of the paper puts forth a provisional targeting scheme is put forward to identify environmental industries likely to experience strong growth. (Oden, 2011)

In addition, Oden's conclusions on the question of where growth will occur are incisive and discuss where cities should concentrate their investment in order to receive the greatest amount of job growth under conservative growth scenarios. "In many cases green industry expansion will trigger revenue and job substitution as when renewable energy replaces fossil fuel or when weatherization reduces conventional energy consumption." His most basic conclusion is that "The growth potential of the energy conservation related segment is large and less dependent upon energy prices or aggressive government action." (Oden, 2011)

2.3.4. International Planning Approaches and Manufacturing Competition.

One interesting intersection of many of the central tensions that must be resolved before the Green Economy can produce employment figures contained in the more optimistic Green Economy growth scenarios is the presence of China. The presence of central planning in China can be characterized as ruthlessly efficient and centrally controlled to a degree that seems impossible in a more open and chaotic democracy, but it is currently having an immense effect on the market competition between the U.S. and China. One reason for this effect is that the important decision makers in China have decided that China will be the leading manufacturer of renewable energy components in solar and wind and have enacted sweeping policy measures that tilts the playing field to such a degree that it is staggering American companies. The competitive advantage that these policies have bestowed on Chinese renewable manufacturers is immense. As noted by the New York Times in their article about Sunzone, a manufacturer of solar panels, "To

help Sunzone, the municipal government transferred to the company 22 acres of valuable urban land close to downtown at a bargain-basement price. That reduced the company's costs and greatly increased its worth and attractiveness to investors. Meanwhile, a state bank is preparing to lend to the company at a low interest rate, and the provincial government is sweetening the deal by reimbursing the company for most of the interest payments, to help Sunzone double its production capacity." (NYTimes, 2011)

It is an open question whether the dominant dynamic between China and the U.S. will be competition or coexistence. Chinese policies are seen by many as violations of various international trade agreements, but are not prosecuted for a number of reasons, including the possibility of triggering dueling trade disputes with this indispensible economic partner. Others see the opportunity for partnerships linking the renewable industries of the United States and China that will bolster and strengthen the industry in both places, making it more likely that the sector as a whole prospers. This is the glass-half full approach. There is also the knowledge that renewable energy production will have to be filled in the coming decades, combined with the world's growing energy demand. What will hopefully happen is that both economies will each fill portions of this demand.

There are other immensely valuable advantages conferred by these policies. "As a clean energy business, Sunzone was allowed to buy the land two years ago for $90,000 an acre. That was one-third of the official price then for industrial land from the government. Industrial land in this desirable neighborhood now sells for $720,000 an acre, giving Sunzone an eightfold profit on paper." (NY Times, 2011)

Particularly germane to the planning field is the Chinese attitude toward the permitting and land development process. While industry experts say that it can take 14 to 16 months to build and equip a solar panel factory in the United States, and getting environmental and other permits can take years, Sunzone was able to complete the expedited approval process available to green businesses in a mere three months, and using permissive labor laws and sheer determination, built and equipped the facility in 8 months. (Bradsher, 2011). One might think that a three-month approval process could

by its nature involve virtually no impartial examination of the long term social benefits and costs of a project, and may contribute to the question of the long-term sustainability of China's sustainable economic development planning. But it also highlights that there are indeed costs the in marketplace that must consider community and stakeholder input.

There is ample evidence that these policies are indeed having an effect. "China vaulted past competitors in Denmark, Germany, Spain and the United States last year to become the world's largest maker of wind turbines, and is poised to expand even further this year." (Bradsher, 2011)

As we know, this type of ramrod economic development is unlikely in the U.S. due to social, environmental, and political considerations. If sustainable economic development is an attempt to bring moral and environmental considerations into the planning decision making process, then this sort of development is something that the United States renewable energy sector will not be able to compete with. Unlike more traditional means of economic development, which labeled many of the environmental and social costs of business as externalities, sustainable business development attempts to walk the tightrope of doing good and doing well at the same time. Given the complications this sector faces in the U.S. this is a difficult challenge.

There are a number of public efforts that are bring made in order to develop this sector in the United States. "American clean energy programs carry many time-consuming and difficult requirements. Companies must show they can repay loans and have innovative technology. The Department of Energy has given conditional approval to 18 renewable energy loan guarantees, although only four have led to the actual issuance of loans so far." (Bradsher, 2011)

This level of national policy coordination and firm decision-making is not likely to happen in the United States. First, there is fact that the political leadership and population have not agreed that spending a large amount of shrinking discretionary budget funds on expanding the renewable energy sector is an idea worth pursuing, and

worth sacrificing other priorities in order to pursue. Second, the centrally-planned nature of the Chinese economy, when combined with the integration made possible by the state-owned-enterprise nature of many of the country's largest energy companies is quite unlike our chaotic, unplanned, but comparatively nimble economic market bias. Thirdly, the nature of the energy demands in China has led to a sustained and well-coordinated plan that the government has had the discipline to follow for almost ten years, a time frame it is difficult to see our Congress matching.

2.3.5. Bezdek's Renewable Energy Growth Scenarios

While the nature of worldwide political, environmental, and economic systems can make future projection extremely difficult, there are academics and researchers who are attempting to do just that. What they have arrived at is the generation of several possible scenarios that take into account the possibilities of aggressive government action and the range of price fluctuations in the conventional and renewable markets. Roger Bezdek of Management Information Systems has also conducted a detailed forecast that presents scenarios labeled basic, moderate, and aggressive. These are of course not exact but are an attempt to provide a picture of possible economic results based on the decisions we make today.

Bezdek describes his base scenario as a ""business as usual" scenario, which assumes no change in policy and no new major renewable energy and energy efficiency (RE and EE) initiatives during next 21 years." (Bezdek, 2008) The base scenario assumes that U.S. and Colorado industries continue to develop according to the general trends and rates of growth seen during the past two decades.

The moderate scenario "assumes that policymakers implement various moderate, incremental (above the base case) federal and state RE and EE initiatives during the next two decades. It assumes a continuation of the positive policies that are in place, plus market conditions favorable to renewables." (Bezdek, 2008)

The aggressive scenario assumes that the U.S drastically changes the nature of its energy and conservation policy. This scenario requires "appropriate, aggressive, sustained public policies at the federal and state level during next two decades." (Bezdek 2008) The author states that "fossil fuel shortages and price increases, security concerns, and action to help mitigate global warming" would be necessary to achieve the aggressive scenario.

For the planners seeking to attract green jobs, it seems like wise council to assume the base scenario when considering possible economic development measures and incentives. As we have seen, there are a number of factors that make the base scenario the best planning tool, and gives us some useful numbers to consider in future planning. Concerning job growth estimates, the aggressive scenario speaks of "more than 40 million Americans employed in these industries—about one in every four working Americans." (Bezdek, 2008) One would imagine there would have to be some sort of cataclysmic environmental or political event for that to take place. The difficulty of course is that it is so difficult to predict the nature and timing of such an event.

"Table 1: Bezdek-MIS Study- Summary of the U.S. Renewable Energy and Energy Efficiency Industries in 2030 Under Three Growth Scenarios

Industry	Revenue (billions 2007$)	Revenue (billions 2007$)	Revenue (billions 2007$)	Total Jobs (Thousands)	Total Jobs (Thousands)	Total Jobs (Thousands)
	Base Case	Moderate Scenario	Aggressive Scenario	Base Case	Moderate Scenario	Aggressive Scenario
Renewable Energy	$98	$212	$560	1,305	2,846	7,328
***Energy Efficiency**	$1,868	$2,036	$3,734	14,953	16,658	29,878
TOTAL	$1,966	$2,248	$4,294	16,258	19,504	37,206

Source: Roger Bezdek. 2008. *Defining, Estimating, and Forecasting The Renewable Energy And Energy Efficiency Industries In The U.S And In Colorado*, Washington DC: Management Information Services, Inc.

This study also presents a breakout of jobs supported under each scenario by subsector. This breakout provides another useful tool for economic development planners in terms

of identifying significant growth sectors under different environmental policy and energy price assumptions.

Table 8: Bezdek-MIS Study- Sector Job Summary of U.S. Renewable Energy and Energy Efficiency Industries in 2030 under Three Growth Scenarios (Total Jobs)

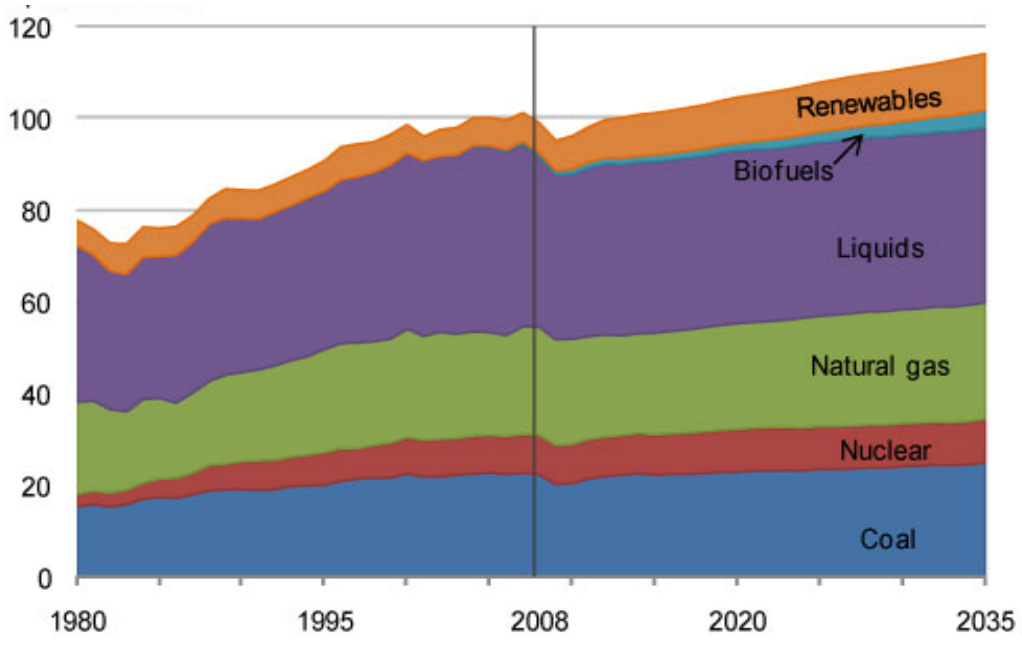
Industry Segment	Base Case	Moderate Scenario	Advanced Scenario
Wind Power	66,200	257,000	1,040,000
Photovoltaics	206,000	415,000	700,000
Solar Thermal	3,800	17,000	540,000
Hydroelectric Power	22,400	24,200	32,300
Geothermal	29,000	85,000	415,000
Biomass-Ethanol	530,000	1,050,000	2,000,000
Biomass-Biodiesel	25,100	56,900	160,000
Biomass-Power	282,000	603,000	1,420,000
Fuel Cells	68,600	158,000	505,000
Hydrogen	47,200	143,000	420,000
Energy Supply Companies	98,000	121,000	196,000
* Recycling, Reuse and Remanufacturing	5,220,000	5,178,000	5,732,000
Vehicle Manufacturing	740,000	912,000	2,770,000
Household Appliances and Lighting	435,000	528,000	1,064,000
Windows and Doors	250,000	298,000	645,000
Electronic Equipment	1,360,000	1,3212,000	1,446,000
HVAC Systems	240,000	276,000	633,000
Industrial and Related Machinery	360,000	623,000	931,000
Misc. Durable Manufacturing	1,640,000	1,840,000	4,230,000
* Non Durable Manufacturing	2,120,000	2,429,000	4,070,000
Utilities	75,000	98,000	204,000
Construction	1,240,000	2,964,000	5,186,000
Total Private Industries	15,928,300	19,079,000	36,114,300
Fed. State and Local Government	311,000	388,200	1,011,050
Non-Profit Organizations	19,700	36,400	80,300
TOTAL All Sectors	16,258,400	19,503,700	37,205,650

Source: Roger Bezdek. 2008. *Defining, Estimating, and Forecasting The Renewable Energy And Energy Efficiency Industries In The U.S And In Colorado*, Washington DC: Management Information Services, Inc.

Bezdek's base scenario highlights another primary reason that EE and conservation jobs and industries should be more attractive to cities. In both the base and moderate scenarios the EE sector is projected to generate approximately $2,000 Billion (1,850 in the base and 2,050 for the moderate) while the RE sector is forecasted to generate $100 Billion in the base scenario and $212 Billion in the moderate scenario. This not only confirms the relative sizes of the two sectors but the greater dependably of the EE sector.

"These kinds of scenarios suggest steady but not dramatic growth in a range of environmental industries – from energy efficient appliance makers to recyclers - whose markets are affected by energy price trends and large scale government interventions. The prospects for aggressive national climate change policy are nil in the short term but could certainly be revived if an unanticipated shock in climate change impacts or other environmental effects (water shortages) occurred." (Bezdek, 2010)

Figure 1: EIA Reference Forecast: Renewable Share of Total Energy Consumption. Primary Energy Use by Fuel (Quadrillion Btu)



Source: U.S. Energy Information Administration, Annual Energy Outlook 2010 with Projections to 2035, Washington D.C: U.S. EIA, May.

Another effort to forecast the composition of the renewable energy market is contained in U.S. Energy Information Administration's (EIA) Annual Energy Outlook 2010 (Figure 1). This forecast reinforces Bezdek's conclusion that the composition of the future energy market will closely resemble the market of today. The EIA does foresee steady and productive growth in renewable energy, and does not predict any immediate lessening of our dependence on coal. This is based on price outweighing other considerations, such as pollution and CO2 use. Again, this is something that should be understood by planners formulating sustainable economic development strategy.

Chapter 3. Case Study #1: Oakland, CA

INTRODUCTION TO CASE STUDIES

Each case study presents the particular strategy being pursued and attempts to isolate and describe what makes notable and instructive. The specific local elements and programs are described, and the strengths and weaknesses of each approach are discussed. Then, the evidence of success or failure is presented to the reader. This involves an examination of the vital context influencing the strategy's success or failure, such as the effect that international competition has on a strategy based on manufacturing renewable energy components. This context is key to understanding why some sorts of strategies are more likely than others to achieve the stated aims of creating local employment and economic benefit.

While there are examples of a wide variety of approaches to developing and strengthening the Green Economy that are currently being used, the three cities chosen to serve as case studies in this report are:

1. The Workforce Development Model, exemplified by Oakland, California;
2. The Repurposing of an existing manufacturing base exemplified by Toledo, Ohio; and
3. The Alternative Energy Portfolio Requirement Model exemplified by Austin, Texas.

These models, along with their underlying motivating factors are studied here in an effort to determine their efficacy and structural validity. They serve as a lens through which we may attempt to better understand how economic development planning is organizing and promoting the diffuse goals of the Green Economy.

3.1. OAKLAND'S STRATEGY

The city of Oakland lists a number of conventional economic development tools on the city website, including:

- Oakland's Enterprise Zone, a business assistance center to help entrepreneurs overcome hurdles and secure financing and permits. The Enterprise Zone is a designation offered by the State of California that encourages development in blighted neighborhoods through tax and regulatory relief to entrepreneurs and investors who launch businesses in the area. Oakland's Enterprise Zone is located in its historic downtown and encompasses 27 square miles and 10,000 businesses;
- The Oakland Green Map to help local businesses and consumers to locate green businesses;
- A number of local business networks, including are active in Oakland, including the East Bay Green Chamber of Commerce, Sustainable Business Alliance, and East Bay Green Drinks; and
- The Oakland Green Jobs Corps, designed to "create green pathways out of poverty for local residents and grow a local green workforce to meet the needs of local businesses. Oakland's Green Jobs Corps matches training to the skills required by local businesses and teaches graduates to install solar panels, weatherize homes to save energy and lower utility bills, and help construct new green buildings." (Oaklandnet, 2011)

The city has officially adopted legislation to support its sustainable economic development goals. These include the city's Sustainable Development Resolution, its Climate Protection Resolution, the Construction and Demolition Recycling Ordinance, in addition to a number of specific green building, recycling, and building demolition ordinances. (Oaklandnet, 2011)

In Oakland, the insistence that workforce development efforts favor local workers, many of whom face barriers to finding or sustaining employment, has arisen partly due to the

city's history. Oakland is a classic example of a city hit hard by the phenomenon of "white flight," which left the city with a generally poorer, entrenched urban population. Due to the fact that the city has long had high crime rates, struggling schools, and other indicators of poverty, a strong history of community organizing was established. The Black Panther Party was one such organization founded in Oakland in 1966. This history has led residents to conclude that they must be involved stakeholders in order to advance their interests.

In this tradition, Oakland's economic development efforts are currently being led by city government and private businesses in an attempt to revitalize the city's historic downtown. These efforts are informed and held to account by a variety of non-profit and community organizations, helping to ensure that public benefit is considered when public projects are being considered. What makes Oakland's efforts stand out from the normal sort of sustainable economic development going on in many American cities is its focus on equity in workforce development and the desire to give many blue-collar or poorer workers access to the benefits of the Green Economy.

These efforts take a number of forms. The city runs programs such as the Oakland Workforce Investment Board (WIB) specifically aimed at assisting workers who have been recently laid off or are re-entering the workforce. The city creates a number of avenues for public-private partnerships that further their goals, such as business improvement districts and community benefit districts. These districts are public-private partnerships in which property and business owners work collaboratively to maintain, develop and promote their commercial districts.

Cities such as Oakland attempt to stimulate targeted growth in targeted sectors by offering tax incentives or by forming partnerships between local government, non-profit organizations, federal government programs, and local businesses. Partnerships between local government and the private sector can be particularly beneficial. The Mayor's Summer Job Program (MSJP) asks local businesses to "make a tax-deductible contribution of $500, $1,000, $1,500, $2,000 or $2,500 to support local youth and non-

profit agencies." (Oaklandnet, 2011) In order to be eligible for one of these jobs, participants must complete pre-employment workshops to prepare them for success on the job.

Job-training pipelines are another technique used to boost the education and skill levels of local workers. The Ella Barker Center was founded with $250,000 in seed money from the City of Oakland in 2008, and now partners with Laney College, a local community college, the Cypress Mandela Construction Training Program, a well-known pre-apprenticeship program aimed at people with barriers to employment, and Growth Sector, a workforce intermediary that connects employers, government, and community agencies. The program has three stages; the recruitment and assessment of potential employees, skills training aimed primarily at skills required by the construction industry, and the achievement of college credit from Laney College. The program also helps participants help in dealing with legal issues, drug and alcohol counseling, and childcare and financial aid. The first class graduated from the program in 2009.

Green For All, the Oakland-based organization founded by Van Jones, is an economic and community development organization dedicated to transforming the economy through sustainable development. Green For All was founded in Oakland but has since expanded its mission to include the entire U.S. economy. It is one example of a local Oakland community organization that has partnered with the city to enact programs and influence the direction of policy. It has three primary missions, which provide a good explication of this approach.

"POLICY DEVELOPMENT:
Green For All develops and advocates for innovative policies that 1) promote the green-collar economy to solve our greatest problems (the economic recovery and environmental crisis), and 2) enable governments to enact policy at the federal, state and local levels that creates new, quality green jobs and invests in green industries.

CAPACITY BUILDING:

Green For All helps develop and strengthen an infrastructure across business, government, labor, non-profit organizations and grassroots communities that will sustain a green-collar economy and create millions of new, quality green jobs. We also cultivate individual leaders to take full advantage of that infrastructure to bring real change to people's lives.

MOVEMENT BUILDING:
Green For All enables, engages and equips a diverse and unlikely national network of leaders, organizations, coalitions and communities to build awareness and increase demand for policies and infrastructure that create new, quality green jobs and invest in green industries." (Green for All, 2011)

Green for All partners with smaller-scale job training options specifically designed for adults who face significant barriers to successful, long-term employment. The Green-Collar Jobs Campaign at the Ella Baker Center for Human Rights advocates for "creating green pathways out of poverty and into the Green Economy for low-income people and people of color. One way to create those opportunities is by advocating for green-collar jobs training programs that serve people facing barriers to employment." (Green for All, 2011)

In Oakland the desire to ensure that the development of the Green Economy and its attendant employment opportunities are available to all races and classes of Americans has been a driving force in shaping the direction of public policy emphasis. Over the last 30-40 years the United States has experienced an ever-growing gap in real income compared to the cost of living index, combined with the spatial concentration of poverty. This has led leaders such as Van Jones, leader of the Green for All movement, to specifically identify the Green Economy as a way to simultaneously grow the economy and address stubborn economic disparities that threaten to create an ever-wider gulf between the classes. The major focus of this approach is workforce development, which is specifically aimed at workers who face barriers to employment, especially those of educational attainment.

The role of planning is a fascinating one to examine here, as there is an effort being made to combine the role of the non-profit sector with local government, but where the idea and animating force first came from the non-profit in question and where the local government, has, to its credit, adapted its goals to aim for the same goals. Oakland is a prime example of a city that emphasizes workforce mobility for workers with barriers to employment as a both a primary motivation and a central method to advancing its Green Economy goals. This idea is strongly driven by the idea that social equity must play a part in the green jobs phenomenon and it efforts are focused on workforce training. This has been adopted as the primary strategy for attracting green jobs to Oakland. Oakland has also been a textbook example of an urban area affected by white flight and suburban expansion after World War II. The East Bay city is the home base for Van Jones and his Green For All movement.

The Oakland Partnership expresses the ethos that underlies this approach. They describe themselves as "a public-private collaborative effort to shape and implement a work plan for creating a vibrant economy for Oakland in which more Oaklanders participate and from which more benefit. " Oakland's efforts are also noteworthy because of their incorporation of CBAs. Community benefit agreements (CBAs) are an attempt to formalize a development contract this is designed to assure that multiple stakeholders have a seat at the table and that a proposed development is one that will benefit both the community and the company in the long term. They are negotiated before the approval of a project in order to proactively ensure that the benefits of a project are accrued by the local community as well as the corporate entity. (Partnership for Working Families 2009) These agreements further demonstrate Oakland's economic development values.

Oakland has used CBAs to advance green job opportunities for low income workers through such agreements as the Alameda Corridor Project. This 1998 agreement, formed between the Alameda Corridor Transportation Authority (ACTA) and the Alameda Corridor Jobs Coalition "required developers to provide job training and placement services to 1,000 residents of the communities surrounding the project - an area with

unemployment levels as high as 34 percent. Of those 1,000 residents, 650 would receive training in a construction trade and 350 would receive non-trade training." (Policylink, 2011)

There has also been a great deal of involvement by local development and community development groups in attempting to bolster the economy for Oakland's working class through stakeholder involvement in the economic development process. The Local Construction Employment Referral Program (LCERP) is a community-based organization that was created after Oakland passed its local hiring ordinance in 1993. This ordinance requires that all Oakland Redevelopment Agency projects and all City of Oakland construction projects of $50,000 or to hire Oakland residents for at least 50 percent of all work hours and for 50 percent of all new hires. These high mandatory set-asides are achieved through "successful partnerships with 35 community based organizations (each serving diverse constituencies throughout the city), which work as outreach and referral agents, and the local union, which places qualified construction workers at publicly financed jobs. The community-based organizations assess individuals and refer them to the local union hall. Participating businesses send requests to the hiring hall, and qualified local workers are dispatched to these job opportunities." (Policylink, 2011)

Stakeholder equity and project ownership is considered especially important in the equity model because of its inherent interest in promoting the greater social good while promoting economic development. Organizations such as the East Bay Alliance for a Sustainable Economy explicitly advocate for economic development that promotes social equity. This organization is a coalition of Oakland-based organizing and advocacy non-profits working to transform economic development policy and win greater community benefits. Their goal are to create a "just and sustainable economy rooted in fairness and inclusion, dignity for all workers, healthy and safe communities, effective and representative government, and a strong, unified movement for social justice." (EBASE, 2011)

Oakland's adoption of this strategy is driven by as much by the motivation to provide equitable opportunity to some of the city's disadvantaged population, in particular young minorities, as it is in increasing the city's economic health. The city is aware that well-paid middle class employment has declined sharply in the United States over the past 40 years. This has in turn resulted in the well-know pattern of concentrated urban poverty. The power brokers in state and city government are on record as supporting this agenda. Recently elected California Governor Jerry Brown has made economic development based on renewable energy a centerpiece of his successful campaign. (Fehrenbacher, 2011)

3.2. EVIDENCE OF SUCCESS.

A primary source used in this paper to evaluate the success or failure of sustainable economic development efforts is the Brookings Institute's report *Sizing the Clean Economy: A National and Regional Green Jobs Assessment.* This report is an important new tool in the effort to solve the vexing classification and evaluation problems mentioned in heading 2.2.

Sizing the Clean Economy shows that the metropolitan area of San Francisco-Oakland-Fremont ranks 6th among the 100 largest metro areas in the overall size of the clean economy. In terms of population, the San Francisco-Oakland-Fremont metro area is the 11th largest MSA in the U.S., indicating that its Green Economy is outperforming what one would expect based on its overall size. (Muro, Rothwell, and Saha, 2011) In addition, San Francisco's 51,811 clean economy jobs make up 2.7 percent of all jobs in the region. On this measure of concentration its clean economy ranks 17th in the U.S.

Between 2003 and 2010 San Francisco added 15,784 clean jobs to see the sector grow by 5.3 percent annually. Those readings placed the region 5th and 30th. On average each clean economy job in San Francisco produces $20,705 in exports, which ranks it 29th on this measure. Finally, the estimated median wage in San Francisco's clean economy is $59,856, compared to $55,431 for jobs in the general or conventional economy in San Francisco. (Muro, Rothwell, and Saha, 2011)

The metro area has also demonstrated strong recent performance in job growth. From January 2008 to 2009, green employment in the Bay Area increased eight percent adding almost 2,500 jobs. (Next 10, 2011) Oakland's Enterprise Zone has been successful in creating new jobs based on the Green Economy. In 2010 alone, it led to the creation of nearly 3,000 new jobs in Oakland. (Oaklandnet, 2011) These are significant rates of growth and indicate that the city's workforce development and job growth targets are seeing progress. The city also reports that the number of Green Economy business establishments has risen from 23 in 2005 to 120 in 2010. (Oaklandnet, 2011) Since 1995, green employment has increased 109 percent, adding nearly 25,000 jobs, while total employment has expanded only 12 percent. (Next 10, 2011)

There are a number of examples of success that has resulted from a concentration on workforce development and training is the Mayor's Summer Jobs Program (MSJP). In 2010, the MSJP trained and placed over 1100 Oakland youth in summer jobs. This year, perhaps as a result of reduced funding, their goal is to train and place over 700 youth into employment. (Oaklandnet, 2011)

The CBA model has also produced results in growing employment among local workers. As part of the Alameda Corridor Project, the Alameda Corridor Jobs Coalition had a goal of graduating 700 residents through its pre-apprenticeship program. This program ended up exceeding that goal, graduating 853 residents. (Policylink, 2011) The Local Construction Employment Referral Program (LCERP) is another successful collaboration. This CBA, which requires that all Oakland Redevelopment Agency projects and all City of Oakland construction projects of $50,000 or more must hire Oakland residents for at least 50 percent of all work hours and for 50 percent of all new hires, has placed 1,618 workers since its inception in 1993. (Policylink, 2011)

When considering optimistic green job growth figures, it is important to remember that many of these jobs are not new, or created out of thin air in a fashion unrelated to any previous profession, but are rather adaptations of jobs that already exist. This is turn may

result in existing occupations experiencing higher rates of growth to demand, which demonstrates again the challenges inherent in attempting to measure green jobs. In fact, if we look at the State of California's projection of the fastest growing occupations we see a list comprised entirely of conventional occupations that currently exist and are only partially linked to the Green Economy. Projected high growth occupations in California include:

- Home Health Aides
- Physician Assistants
- Fitness Trainers and Aerobics Instructors
- Network Systems and Data Communications Analysts
- Medical Scientists, Except Epidemiologists
- Biochemists and Biophysicists
- Occupational Therapists
- Physical Therapists
- Medical Assistants
- Dental Assistants
- Dental Hygienists (CA.gov)

What this tells us is that for all the excitement about the Green Economy, and for all the success Oakland has achieved with its strategy, conventional jobs still lead job creation forecasts. The partners invested in growing green jobs in Oakland must take into account that there are conventional occupations listed here (network systems analysts, biophysicists) who may well possess skills that can transferred over to contribute to green industry growth.

3.3. Strengths and Weaknesses of this Approach.

The evidence indicates that Oakland is seeing it investments produce a Green Economy that is outperforming the larger general economy. Simply put, the Green Economy is producing a large number of jobs in a difficult economy and in a city that has had trouble growing employment. We know that the relatively small size of the Green Economy

means that even this success is unlikely to have a huge impact on the overall state or minority unemployment numbers, but it is significant nonetheless. What these reports tell us is that Oakland and the larger Bay Area have achieved measurable success in developing the green economic sector. The arrival of the BLS' green employment classification system update should provide valuable future data with which to continue updating this subject.

One major strength of this approach is that by focusing as much on conservation, construction, construction recycling and other forms of local, labor-intensive conservation measures is that these jobs are much less vulnerable to international competition, outsourcing, or business relocation. Simply put, these sorts of jobs MUST be done by local workers and must be done within city limits, because that is where the majority of businesses and residences are located. This is especially important for a city like Oakland that has consistently labored over the last 30-40 years to attract and retain businesses within its city limits. The favorable growth numbers in jobs and business establishments also demonstrate that the goals put forth by the city government and local non-profits are being met.

In addition, this strategy is likely to succeed with the widest possible range of energy pricing and Green Economy growth scenarios and mesh with the overall recommendation that cities concentrate their sustainable economic development planning and incentive efforts on the energy efficiency and conservation measures. Using either the base or moderate growth scenarios provided by Bezdek, Oakland seems likely to experience further benefits from its green job workforce strategy.

Chapter 4. Case Study #2: Toledo, Ohio

4.1. TOLEDO'S STRATEGY

The story of Toledo, Ohio, is the story of a city placing a large bet on the Green Economy invigorating effect based on the revival of a formerly dominant position in manufacturing. Toledo's strategy is based on two distinct but interrelated sustainable economic development strategies. The first is to develop a national reputation as a center for renewable energy research and development. The second is to repurpose the city's formerly productive manufacturing facilities and workers and to lure companies that manufacture renewable energy components, particularly the latest solar technology, thin-film photovoltaic solar panels. This strategy has proven to be quite successful and is helping Toledo replace a portion of the high wage jobs formerly provided by the manufacturing sector that were lost in the 1970's, 80's, and 90's. This result proves that despite the pressures the city's green manufacturing base faces from international competition, it can thrive and be an important job creator. There is a good deal of evidence suggesting that the higher growth rates associated with renewable energy and its component manufacturing can be the basis of a successful green economic development strategy, despite being smaller and more unstable than the conservation sector.

Part of a city and a region of the country with a different historical economic strength than Oakland, Toledo is attempting to become a greener city by capturing a portion of the manufacturing sector that serves green industries. At the same time that the public sector attempts to create a receptive business environment for green manufacturing it is focusing on partnering with local universities to build its brand as a home for alternative energy research and development. Toledo's evolution as a center of the solar industry is the result of a unique, communitywide effort that includes representatives of the city and county, economic development groups, non-profits, local businesses, and the University of Toledo and Owens Community College. The officials from government, academia

and business who are steering Toledo's transformation call themselves “the partners" and meet on a regular basis in an attempt to form a coherent economic development strategy.

The University of Toledo's Innovation Enterprises is an outcome of these partnerships, and is devoted to helping companies turn university research into commercial products. This is a common step taken by public-academic partnerships attempting to develop strength in research and development. “The partners decided about two years ago that the only way to revive the area's economy as manufacturing jobs in the glass and auto parts industries disappeared was to bring its major institutions together to think boldly and share responsibility for creating jobs. Before then, we didn't have a common vision. People were parochial." (Keen, 2011)

These collaborations have led to the creation or reinvigoration and further investment in a number of institutions and programs, including:

- The School of Solar and Advanced Renewable Energy at The University of Toledo, made up of faculty members from multiple disciplines, including physics, chemistry, engineering and business;
- The Wright Center for Photovoltaics Innovation and Commercialization, a university, industry and government collaboration focused on reducing solar costs, improving technologies, and transferring knowledge from laboratories to the production line; and
- The University Clean Energy Alliance of Ohio, which coordinates collaboration among state universities in the discovery, development and commercialization of energy-related technology; and
- The University of Toledo’s Clean and Alternative Energy Incubator, which provides university spin off businesses and start up alternative energy companies with assistance, including “office space and infrastructure, links to university research, access to University Technology Transfer services, access to university interns, connection to the university and other community business resources,

connection to financial resources and investment opportunities, and networking opportunities with other technology based businesses." (Keen, 2011)

The University of Toledo's Clean and Alternative Energy Incubator is an example of a partnership created and funded by local government, educational institutions, and business institutions. It offers a number of services, including management assistance, access to financing, and connections to business or technical support services, designed to nurture the development of entrepreneurial companies. This in turn contributes to the number of successful renewable energy companies located in Toledo, boosting the city's profile and delivering results that argue for continued investment. As of October 2010, the Clean and Alternative Energy Incubator has contributed $85.7 million of economic impact. (UToledo, 2011)

Toledo has partnered with the state of Ohio to support the growth of this industry, including securing $18.6 million in support from the Ohio Department of Development. Like many states, Ohio passed a bill requiring that renewable energy be accounted for in the state's energy portfolio. In this case, Ohio Senate Bill 221 mandates that by 2025 25% of electricity sold in Ohio must be generated from alternative energy sources. While currently the state only has 20 megawatts of solar and wind capacity, almost 1,300 megawatts of wind are currently in the development pipeline in Ohio. These portfolio standards could provide some ongoing growth demand for Toledo's renewable energy manufacturing.

4.2. Evidence of Success

"In the solar world, Toledo is a hot spot," says Xunming Deng, a physics professor on leave from the University of Toledo. (Keen, 2011) The University of Toledo is home to top solar researchers and has a business incubator that provides business services to solar entrepreneurs. It has graduated four solar companies and is working with six more. Owens Community College, which had 13 students in its first solar class in 2004, has trained 255 solar installers. (Weinstein, 2009) In addition, this strategy provides a hopeful and optimistic possible future for the battered workers of Ohio, who have

experienced the decline in the auto industry. “"I think the biggest change in this industry from what I was used to [in the auto industry] is the optimism," says Mohring, an engineering manager at the company.” (CNBC, 2009) This can be a valuable dynamic in a region with what may be characterized as low self-esteem.

Institutions such as the University of Toledo’s Clean and Alternative Energy Incubator are producing tangible results. In this case that means both producing economic benefit and job creation. As of October 2010, the Clean and Alternative Energy Incubator has contributed $85.7 million of economic impact. (UToledo, 2011). In addition, it has produced a total of 245 jobs in the last 5 years. (UToledo, 2011) While the totals are somewhat modest, they indicate progress in an economic sector that was not previously a source of growth for Toledo.

There is ample evidence that Toledo is achieving many of its goals. As of June 2010, at least 6,000 people work in the area's solar industry. First Solar employs more than 1,000 people at its 900,000-square-foot plant. There are more than a dozen solar-related start-up companies in the area. The University of Toledo is home to top solar researchers and has a business incubator that provides business services to solar entrepreneurs. It has graduated four solar companies and is working with six more. Owens Community College, which had 13 students in its first solar class in 2004, has trained 255 solar installers. (Keen, 2010)

Toledo is seeing some striking success in its efforts to become a Midwest center for the Green Economy. In terms of its overall size the clean economy in the Toledo metropolitan area ranks 45th among the 100 largest metro areas, much higher than what might be expected from the 81st largest U.S. metropolitan statistical area. (U.S. Census, 2010). In addition, Toledo's 11,831 clean economy jobs make up 3.9 percent of all jobs in the region, making the city the 5th ranked city using this measure of concentration. Between 2003 and 2010 Toledo added 4,958 clean jobs to see the sector grow by 8.1 percent annually. (Muro, Rothwell, and Saha, 2011)

Because of Toledo's focus on renewable energy manufacturing, which is dependent on exports, any measurement of exports is particularly valuable in assessing the success of Toledo's strategy. According to the Brookings reports, "On average each clean economy job in Toledo produces $25,371 in exports, which ranks it 15th on this measure." (Muro, Rothwell, and Saha, 2011) This is indicative that despite the challenges faced by export and renewable energy production, Toledo is overcoming the inherent obstacles and experiencing success in its sustainable economic development planning efforts. "We can conclude that Toledo's efforts are yielding a significant benefit for the region, as well as adding to the optimism of the economy of an area that has seen its share of depressing news in the past." (Brookings, 2011)

There are inherent complications in evaluating the success or failure of Toledo's efforts. Because the Bureau of Labor Statistics current North American Industry Classification System (NAICS) is not able to isolate green jobs within its current job classifications, publications such as "The Solar and Wind Energy Supply Chain in Ohio," published by the Environmental Law and Policy Center, are especially valuable tools when assessing the level of success Toledo and Ohio have achieved with their efforts to establish renewable manufacturing. The Report reveals that has the state of Ohio has 63 solar power supply chain businesses and 106 wind power supply chain businesses, while Toledo area has 14 such businesses, 10 of which are related to solar energy. This is an inversion of the rate of solar to wind businesses in the rest of the state, an indication to me that the city's efforts are bearing fruit and attracting the type of targeted businesses. (Craig et al., 2011).

The establishment of Toledo as a renewable energy manufacturing center is attracting foreign investment as well. "US-based First Solar Inc, has signed a memorandum of understanding (MOU) with China Guangdong Nuclear Solar Energy Development Co Ltd (CGN SEDC) on Wednesday to jointly develop the world's largest solar power plant…a 2,000-megawatt solar plant in Ordos, a subdivision of Inner Mongolia." (Bootsontheroof, 2011) Construction is expected to take ten years to complete. This is

certainly an interesting twist on the competition between U.S. and China, and may well indicate that a mutually beneficial relationship is possible.

4.3. Strengths and Weaknesses of this Approach

The key question that must be answered when Toledo's efforts is whether significant portions of the manufacturing component of the Green Economy can be captured in this region or even within the U.S., considering the fact that manufacturing has been declining as a share of the total economy in the U.S. since the 1970's. China in particular is proving a formidable competitor for Toledo, as they are investing not only financial and land resources in building up their solar manufacturing sector, but are also displaying a degree of single-minded and aggressive government-led planning. As with many other products, they are able to manufacture renewable energy components at a much cheaper cost than comparable U.S. companies. There are a number of structural advantages enjoyed by companies based in other countries that may prove impossible for places like Ohio to overcome.

There are advantages enjoyed by Toledo and other midwestern cities. Renewable energy manufacturing may be a more successful approach here due to the presence of an existing manufacturing infrastructure that was previously devoted to the auto industry. This means that facilities stand ready to be converted to other manufacturing purposes, such as solar. This land is already zoned and has been used for manufacturing, and there is a worker population that has experience with manufacturing. The fact that there is a manufacturing tradition in place also means that this idea may be more successful in establishing itself.

One weakness that must be considered in the face of this success is the vulnerability of this strategy to a wider range of energy pricing and Green Economy development scenarios. If energy prices do not rise as expected or do not match some of the more optimistic growth scenarios listed in Bezdek's study, this strategy could be difficult to sustain in future years. There is a large difference between Bezdek's base and moderate

growth scenarios in the renewable energy sector, and political and social trends seem to favor the more pessimistic base scenario, which will have the effect of limiting the growth of the renewable energy sector.

In addition, Toledo faces stiff competition with China when it comes to manufacturing, presenting an additional factor in the planning equation. "Barely a player in the solar industry five years ago, China is on track to produce more than half the world's solar panels this year…China is also on track to make nearly half of the world's wind turbines this year." (Bradsher, 2011) China offers financial incentives for utilities to use wind power, which is less costly than solar power, and the country passed the United States last year as the world's largest wind turbine market.

In addition, China's production of solar panels is receiving a huge unintended boost from European and American policies designed to improve the country's carbon output and to encourage their sustainable and renewable energy economic development. What was not anticipated was the Chinese response to this opening in the market. "More than 95 percent of them will be exported to countries like the United States and Germany that offer generous subsidies for consumers who buy solar panels." (Bradsher, 2011) This effect is exasperated by China's policies concerning its import of foreign wind turbines or solar panels. Currently, China itself imports virtually no wind turbines or solar panels, choosing to protect their developing industries through legal requirements that frankly smack of protectionism. Until 2010, China required that 70 percent of the content of each wind turbine and 80 percent of the content of each solar panel be made within China. (Woody, 2011) After private objections from American officials China rescinded these requirements. This may have well proved to be akin to closing the barn door after the departure of the horse, because of the dominant market share they had attained by 2011 of the low-cost solar panels.

There is ample evidence that these polices have a significant effect on efforts such as Toledo's. "China's expansion has been traumatic for American and European solar power manufacturers, and Western wind turbine makers are now bracing to compete with

low-cost Chinese exports. This year, BP shut down its solar panel manufacturing in Frederick, Md., and in Spain, and laid off most of the employees while expanding a joint venture in China…Evergreen Solar of Marlboro, Mass., plans to move the final manufacturing steps for its solar panels from Devens, Mass., to China next summer, eliminating 300 American jobs, after struggling to borrow money in the United States and after finding that costs in China were lower. (Bradsher, 2011)

In addition, the importance of stronger coordinated federal and state carbon tax and pollution policies to the growth of renewable energy will likely tend to retard the growth of the sector. Tax policy in particular is mentioned as a vital element in encouraging investment in these industries, although even in this report devoted to this specific topic, some of the incentives they mention are either inactive or not yet adopted by Congress, including the Federal Renewable Electricity Standard, which is only a proposal currently, and the Qualifying Advanced Energy Manufacturing Investment Tax Credit, which enabled renewable energy manufacturers to take a 30% Federal Investment Tax Credit until the program expired in 2009. (Craig 2011)

Happily, however, we can conclude that based on the size of Toledo's Green Economy compared to its overall economy (45th compared to 81st) provides evidence that this strategy is proving successful in the current economic and political environment. In addition, the fact that green jobs in Toledo make up 3.9 percent of all jobs in the region, ranking the city 5th ranked using this measure of concentration, gives great deal of hope to those cities that are counting of renewable energy manufacturing to add jobs and establishments. The results show that despite the vulnerability to international competition Toledo is holding its own and expanding this sector. This is something to feel good about in a region that sorely needs it.

Chapter 5. Case Study #3: Austin, Texas

5.1. AUSTIN'S STRATEGY

Austin is city worthy of policy study for a number of reasons. The main focus of Austin's Green Economy development efforts is the adoption of policies that help to bolster the renewable energy sector within city limits. This takes place through a number of initiatives. The first is Austin's policy of requiring that a certain percentage of the city's energy be created or purchased from renewable energy sources. In Austin, this has taken the form of recruiting clean tech companies, building new clean tech startups from the ground up, and sponsoring clean technology research at the University of Texas. In addition, the city has been cultivating a national reputation as a leader in solar research and renewable energy research and development, but partly due to a lack of manufacturing capacity, has not seen the full economic benefit of being a leader in this sector. Finally, the fact that Austin is the home of the University of Texas has provided city and higher education leaders with the opportunity to develop the city's reputation as a center of research in renewable energy. In addition, the university has expended additional effort to monetize the fruits of local research through the development of the unfortunately recently defunct Office of Research and Technology Transfer. The results of this investment have proved impressive.

Austin has a multi-pronged economic development strategy that is centered on trumpeting Austin's young, highly educated, and creative workforce and the city's high quality of life. In addition, the City Council has offered targeted incentives to specifically chosen companies to relocate. The Mayor's Taskforce on the Economy, released as a guideline in 2003, delineates Austin's economic development priorities, and describes Austin's strengths as "innovation, creativity, and entrepreneurship, which are embedded in its people, existing firms, community institutions, and the natural environment in which the city is located." (City of Austin, 2003) While there is some general agreement on this broad goal, the city has a long and contentious history of

conflict around issues of growth, sprawl, traffic, taxes, and public investment. As the city puts it, "What has not been determined is how best to leverage these assets. Part of the problem is that there is not (nor can there be) one single organization that assumes responsibility for all the factors that contribute to the overall long-run development of the local economy, as different institutions are concerned with different aspects of economic development…The City plays a somewhat indirect role in this equation, as its provision of services such as public safety, utilities, roads affordable housing, and recreational/cultural amenities are part of the overall economic infrastructure of the community." (City of Austin, 2003)

In addition, the city has an expressed desire to become a more environmentally conscious and sustainable place to live and do business. When it comes to the Green Economy, Austin has been more focused on reducing its dependence on conventional energy sources, mitigating CO2 release and environmental impact, and on setting goals for the local electric utility than on creating green jobs. "We are committed to purchasing and generating renewable energy. We feel it's vital to our economy and our environment to develop and implement clean energy. We look forward to the opportunity to purchase plug-in hybrids for our transportation needs" - Will Wynn, former Mayor of Austin (Austin Chamber of Commerce, 2011)

With a great deal less fanfare, Austin Energy offers a number of considerable rebates for residential and commercial customers that is helping to both reduce energy and to contribute to job growth. These rebates include federal programs such as the Energy Efficiency and Conservation Block Grants. ……

Another effort to delineate Austin's priorities is detailed in *Building a More Sustainable Economy: Economic Development Strategy and Public Incentives in Austin*, a study authored by economist Michael Oden. The organization Liveable City commissioned the report to address concerns that "Austin's economic development process is viewed by many as detached from community priorities, is secretive and is removed from informed decision-making and accountability. Other factors leading to the study are increasing

national and global competition, the current economic downturn, and ongoing conflicts over tax incentives to retail businesses." (Oden, 2008)

The study finds that compared to many other communities, the city and Greater Austin Chamber of Commerce have demonstrated a sophisticated approach to economic development and have been relatively disciplined in the granting of public incentives to desired firms. Austin has completed just 19 tax incentive deals from 1991-2006 compared to 91 in Houston and 208 in Dallas. (Oden, 2008) Incentives are also now performance based, requiring firms to meet agreed upon job creation and investment targets to receive the incentive. The city has attempted to lure a number of green businesses, but has not had much success in getting them to relocate. This may be related to the modesty of the city's incentive program.

Perhaps the city's most central Green Economic development strategy is the requirement that renewable energy be a significant part of its energy generation planning. Austin Energy's strategic plan points to its commitment to "an energy resource strategy, which first seeks cost-effective renewable energy and demand-side solutions to meet its customers' new energy needs, before resorting to traditional utility energy sources". (Austin Energy, 2011)

In 1999 the city council approved a resolution calling for Austin Energy to obtain – by 2004 – five percent of its electricity from renewable sources. Today, a mere 10 years later, the utility generates 12% of its electricity from renewable energy, including 439 megawatts of wind power. Moreover, in August the utility unveiled a revised, long-range plan, calling for the generation of 35% of its electricity from renewable energy by 2020, up five percent from a similar projection last year. It is anticipated that the city will have to approximately double the amount of wind energy to 1001 megawatts, as well as doubling the amount of solar power. (Smith, 2011)

The main tool employed by the City of Austin to encourage development of the renewable energy sector is the Renewable Portfolio Standard (RPS), regulation that be

passed by local or city government (in this case, by the Austin City Council), that requires that a specific percentage of the city's energy be produced from renewable energy sources, such as wind, solar, biomass, and geothermal. These required percentages usually rise over time as cities and utilities are expected to be able to more cost-effectively supply renewable energy. These policies often rely on private energy providers to be successful, which in theory could make them successful economic development tools, if this demand were filled by local productions. As we will discuss, this is not the case in Austin. These polices also often result in private companies earning credit or certificates for every unit of electricity they produce, which they can sell along with their electricity to supply companies. The utility can then use these certificates to demonstrate their compliance with their RPS requirements. These sorts of regulations have been become increasingly popular, and seem to be more acceptable politically, as they provide a role for private industry to fill a need, rather than using public money to build expensive new renewable power generating capacity. As with much of sustainable economic development, the motivation is environmental as well as economic.

Another tool used in Austin to seed the ground for renewable energy is the adoption of broad climate and carbon dioxide emission goals. Part of Austin's attempt to build its brand as a leading research and development region is its adoption of additional renewable energy policies in the Austin Climate Protection Plan of 2007. This plan required all city departments to create action plans consistent with the goals delineated in the Plan. In response, Austin Energy, the city's major utility provider, developed its ambitious Resource, Generation, and Climate Protection Plan to 2020 (also know as The Plan), which lays out a number of ambitious goals concerning the percentage of energy, which should be generated through renewable sources. (City of Austin, 2011)

Perhaps the most successful initiative based on energy provision policy is the city's GreenChoice Program. GreenChoice offers customers the option of paying a higher utility rate in return for the knowledge that the customer's energy is produced from renewable energy sources. Austin Energy's GreenChoice is the nation's most successful utility-sponsored voluntary green-pricing program, and produces almost 800 million

kilowatt-hours in subscriptions and growing (The Plan, 2011). This program is considered a model around the county for a voluntary method through which a city may encourage its utilities to see more energy generated from renewable sources. In addition, this program is a major reason Austin is considered a green city. The establishment of this reputation is a major goal of Austin's policy leaders. The question is how well reality backs up this reputation is discussed in Subchapter 5.3.

It is important to note that this program is based on the willingness of the customer to pay a higher utility bill each month. The amount is substantial. The current regular fuel charge, currently at 3.105 cents per kWh is replaced with the GreenChoice charge of 5.7 cents per kWh. This rate is fixed through December 31, 2014. A residential customer using an average of 1,000 kWh per month will pay about $25.95 per month more by subscribing to GreenChoice. It is also important to note that due to pricing pressures, this option is going to become a more difficult choice for many current subscribers, and the current GreenChoice rate will increase on March 1, 2011. (Austin Energy, 2011)

5.2. Evidence of Success

Austin has experienced some measurable success in recent years in its percentage of total employment from jobs that are considered to be green. And yet the overall Green Economy employment and job creation numbers for the city may be described as enigmatic. The 2010 National Census listed Austin as the 14th largest city in the United States, but using the more accurate metropolitan statistical area (MSA) measuring unit names Austin as the 35th largest MSA in the country. (U.S. Census, 2011) That corresponds almost exactly with the Brookings Institute's ranking of Austin as the 36th largest Green Economy. (Muro, Rothwell, and Saha, 2011) One would think that this would be higher given Austin's reputation as a national leader. In addition, the percentage of Austin's employment that meets the green jobs definition is 43rd, again below where one might reasonably expect it to be. (Muro, Rothwell, and Saha, 2011) These numbers indicate that Austin's national reputation as a "green city" may well be

overblown, and indicate a weakness in overall sustainable economic development planning.

In addition, an average each clean economy job in Austin produces $10,414 in exports, which ranks it 68th. (Muro, Rothwell, and Saha, 2011) This is a concrete example that reinforces the conclusion that the manufacturing and renewable energy provision sectors of Austin's Green Economy are indeed underperforming. In the real world it is quite difficult for a Green Economy to succeed in all possible sectors, such as manufacturing, research and development, and workforce development, at the same time. Austin has experienced a complicated set of outcomes from its efforts to make the city a major player in the renewable energy research and provision sector. There is little doubt that the city and state have seen its green economic profile rise in recent years. Texas is listed as being in the large, growing jobs category in the 2007 Pew Charitable Trust Clean Energy Economy Report, with an annual growth rate of 1.70% (Pew 2007)

On the other hand, there are some very real positive indicators that support Austin's reputation as a green economic stronghold and that provide ample reason for future confidence that these policies are proving successful and are worthy of continued capital and political investment. Between 2003 and 2010, Austin added 4,447 clean jobs and experienced a 5.3% annual growth rate. These numbers move Austin's ranking above where it would be expected based on size, placing the region 31st and 29th respectively. In addition, the estimated median wage for Austin's green jobs is $40,441, which compares to $39,239 for all jobs in the city in general. (Muro, Rothwell, and Saha, 2011) These numbers indicate that this is a sector still reaching for maturity and offering a great deal of promise that continued investment will be justified.

A central plank of Austin's sustainable economic development planning is also based on attracting research and development activity. Austin and the University of Texas at Austin have a strong record of forming mutually beneficial programs and institutions as well as monetizing the commercial products resulting from these efforts. Places such as the Austin Technology Incubator (ATI) bring together "business, government and

academic resources to provide strategic counsel, operational guidance, and infrastructure support to member companies to help them transition into successful, high growth technology businesses." (ATI, 2011)

The research and development component of Austin's sustainable economic development strategy has been a huge success. Austin has indeed cemented its brand as an environmentally conscious city. "Since its founding in 1989, ATI has worked with over 200 companies, helping them raise over $750 million in investor capital. Over the past three years of the "Great Recession," ATI has incubated over 50 companies and helped them raise over $70 million in investor capital; during that same 3 year period, ATI alumni companies realized over $300 million in exit value." (ATI, 2011)

Austin's energy policies are driven by a number of different reasons, including a variety of environmental, conservation, and economic development motivations. The city has enacted such ambitious and forward thinking initiatives as the 2020 Zero Waste Plan, which is also driven by this combination of goals. These efforts will likely be enhanced by the strong national market for renewable energy. The National Solar Job Census, published by the Solar Foundation in 2010, projects that over half of all solar employers expect to increase their number of solar jobs and experience significant growth in the next 12 months. (Johnson, 2011)

5.3. Strengths and Weaknesses of this Approach

While Austin has succeed in stimulating awareness and use of renewable energy through its GreenChoice program, the lack of a more robust overall Green Economy reveals a glaring flaw in Austin Energy's demand-side management. If the coordination of environmental goals and job growth strategies were better managed, the efficiency of these two initiatives could be a mutually reinforcing dynamic that immensely benefits Austin. As with so much of Austin's larger planning efforts, however, one gets the sense that these programs are running on parallel tracks and not realizing their full benefit. One of the big weaknesses or missed opportunities produced by Austin's strategy has been

that all of these renewable energy generation regulations have led to a boost in capacity that is being filled by companies outside of Austin, wasting a great deal of the economic development potential they generate. If the city were able to attract more manufacturing establishments it might well close the gap in these policies and experience an overall growth in the Green Economy. The fact that the Brookings report contains disappointing overall Green Economy numbers for Austin means that greater coordination is needed.

This illustrates the problematic nature of the focus of Austin Energy's mandates. They are more concerned about fulfilling percentages than where the energy is coming from. While it is certainly not possible for Central Texas to produce wind energy at the same pace as wide-open West Texas, there is certainly the potential to increase the percentage of energy coming from solar energy, which would in turn help to develop the city's nascent solar companies. A regulation such as a mandate that a certain percentage of renewable energy be from locally-generated sources is a missed opportunity to develop the local Green Economy.

Another weakness of this strategy is that it leaves the city very vulnerable to price increases, which it would then have to pass on to its utility customers. This could in turn lessen the public and political support for alternative energy if the pricing becomes too uncompetitive with conventional energy. While conventional energy prices are rising, so is the price of energy generated from renewable sources, and energy prices are already an issue for poor and working class families. Rapidly rising energy prices are considered a regressive tax on the poorer members of a community, an issue that Austin is already struggling with. If we assume that renewable energy sector growth will most closely resemble Bezdek's base or moderate growth scenarios, with a minimum of change in federal and state pollution or carbon taxes and other efforts to account for conventional energy's negative externalities, their may well be a ceiling on the growth of the renewable energy sector. This would then threaten the political support for Austin's utility mandates.

Austin's research and development programs and institutions are proving more successful in generating job growth and in attracting venture capital investment, but again this does not seem to be leading to a growth of local establishments based on the commercialization of the emerging ideas. ATI lists economic development in Central Texas as one part of its dual mission, and the fact that companies emerging from ATI have generated over $300 million in exit value indicates that it is fulfilling the mission it set for itself.

Like many cities, Austin faces an environment in which it is attempting to use local policy initiatives to make up for a lack of national leadership. A common lament among sustainable economic development planners when studying this topic is the lack of a coherent national green energy policy within the United States. This not only makes it extremely difficult to achieve meaningful reduction in greenhouse gas emissions but also dramatically under powers American performance in this sector. Our scattershot policy is often lamented by planners in comparison with countries in the European Union, such as Germany or Spain, or with China, who is reaping the benefits of centralized policy control coupled with business development. While many question the efficacy of cities or states pursuing their own economic development goals through creative use of policy changes and incentive programs, they remain the only game in town when attempting to fill the vacuum left by inaction at the federal level.

Austin is also instructive when examining the difficulty that securing political approval for these types of initiatives. As is often the case with planning or political decisions that require additional funds or attempt to alter the current function of any current societal process, the requirement hit a road block during the political process to approve it. "The Austin City Council, using goals set by council in 2007 when it adopted the city's climate protection plan, the Austin Energy Resource, Generation and Climate Protection Plan would, by 2020, increase the energy efficiency goal from 700 megawatts to 800 megawatts, increase the renewable energy goal from 30 percent to 35 percent, increase the solar component of the renewable energy goal from 100 megawatts to 200 megawatts

and establish a carbon dioxide reduction goal of 20 percent below 2005 levels. (Community Impact, 2011)

Notwithstanding Austin Energy's challenging renewable energy goals, the utility still faces many of the same issues other utilities do. Wind Power, for instance, is more efficiently generated in the Panhandle and Western regions of the state, yet Austin is the most robust marketplace in the state. This spatial mismatch is something that all utilities face in their efforts to transmit renewable energy, and Austin Energy must be given an allowance for that. The Electric Reliability Council of Texas (ERCOT), which operates the state's electric grid, is developing a renewable energy-friendly grid, but it will be five years before it is fully in operation. In addition, solar generation continues to be limited by the cost of the technology versus conventional energy. The strength of the larger renewable energy market will in turn have a huge effect on Austin's success as a hub or research and development site for solar energy. Bolstered by strong government commitment over the past two years, the US is shaping up to be the largest solar market in the world, with its potential serving to attract Chinese companies to invest in U.S. manufacturing plants. (Bradsher, 2011)

While clean energy advocates were hoping the Plan would be both approved and go into effect immediately, the reality was a bit murkier. The City Council approved the Plan but it would not go into effect until the next year when an accompanying affordability study was completed. Certainly renewable energy supporters are concerned that the political pressure not to increase utility rates, especially in the midst of a stubborn recession, may prove difficult to overcome during that time frame. This complicates the picture when considering the level of commitment to pursuing renewable energy goals in the face of higher prices and organized political opposition. Interestingly the plan calls for Biomass energy to be phased out by the deadline, while wind will produce 115 MW and solar 40. (Community Impact, 2011) All of these difficulties and inefficiencies should inform Austin's future sustainable economic development planning.

Chapter 6: Conclusion

6.1. Strengths and Weaknesses of Each Case

This paper examines three American cities in an attempt to delineate and evaluate how well a wide range of economic development strategies are working and are likely to work in the most reasonable future growth scenarios. The paper looks at how the case study cites are progressing with their policies and analyzing the attendant growth from these policies. The case studies provided by Oakland, Toledo, and Austin are illustrative of American cities attempting to fill the national policy vacuum with local policy. This approach has its problems, but also gives these cities a chance to grow within a sector that has an enviable growth rate, is likely keep growing even absent significant national policy action, and which meet their goals concerning sustainability, environmental protection, and energy generation and conservation.

Of the three case studies included in this paper, Oakland is doing the best job of focusing its policy on attracting these jobs because the tools they use in pursuit of these policies, including CBAs that require local employment and their concentration on conservation measures, are the most reliable job creation strategies. In addition, job creation strategies based on conservation as opposed to renewable energy manufacturing exemplified by Toledo and renewable energy portfolio standard requirements exemplified by Austin are more vulnerable to international competition. Finally, Oakland's strategy has the greatest chance of succeeding in the most likely base or moderate growth scenario described by Bezdek in Chapter 2. This means that a strategy based on local workers performing energy efficiency and conservation measures provides a city with the greatest ability to quickly adapt to changing conditions in the economic, political, and environmental spheres.

Oakland and the Bay Area have seen a significant rise in the number of jobs and income in the Green Economy. Job creation, income, and growth rate have all been strong in the recent years of the city and state's Green Economy. One major strength of their approach is that by focusing on conservation, construction, and construction recycling the city is taking measures that mesh well with its goals of workforce development. In addition, these jobs are much less vulnerable to international competition, outsourcing, or business relocation.

Toledo is an interesting case as well of a downtrodden portion of the state of Ohio and the country in general that experienced success as a result of proactive planning and economic targeting measures. Toledo is proving successful in branding itself as a manufacturing and research and development hub, a brand that is leading major solar manufacturers in China and the United States to invest in manufacturing in this portion of Ohio. The threat of Chinese competition is significant, as is the greater risk in depending on renewable energy manufacturing, but Toledo seems primed to benefit from its capture of renewable manufacturing market share. The fact that Toledo has the 5th highest concentration of green jobs compared to overall employment (Brookings, 2011) is merely one of the indicators that the city's strategy is producing tangible results.

Finally, the case study of Austin illustrates some of the advantages and pitfalls of using regulation and a publicly owned utility to attempt to boost the market for renewable energy provision and research and development. So far, it seems that the brand or reputation is outperforming the production, as the amount and growth rate of Austin's Green Economy is mostly in line with what one would expect given its size. As with the other cities, however, there is also ample evidence that the green economic growth that is present provides valuable higher-wage employment that can reasonably be expected to experience continued growth. In addition, the lack of a more robust overall Green Economy reveals a wasted opportunity to use these measures to benefit local establishments. Austin would experience a far greater benefit if it were able to better coordinate its environmental goals and job growth strategies.

6.2. THE MOST SIGNIFICANT CHALLENGES FACING LOCAL ECONOMIC DEVELOPMENT PLANNING.

What are we to make of a portion of the American economy that constitutes less than 2% of its overall production and yet at times seems to be charged with saving us all from our own version of Japan's "Lost Decade" of economic malaise? Will the emerging Green Economy "save" us from our unthinking environmental destruction, letting us off the hook for making difficult choices concerning how we will employ, house, and feed our population? We know that our current methods of providing for the world's growing population and energy needs are clearly unsustainable in the long-term, but the renewable energy that is only hope of meeting these needs without poisoning the planet is not yet competitive on price point with coal, oil, and gas.

In seeking to answer these questions, a number of formidable problems present themselves. In part because of the lack of specific green job BLS NAICS categories (something scheduled to be available within a year or two), each researcher or forecaster must decide for himself which is more relevant; the high annual growth average for green jobs versus the still relatively small percentage of the Green Economy as a whole. In addition, given the comparative youth of the concept of a Green Economy, evaluation of the growth potential of this sector can be subject to a great deal of interpretation.

One way to assist in accurate forecasting of possible Green Economy growth scenarios is to choose the most important factors influencing where future growth will likely occur. In this paper, they are identified as:

- Conventional energy and resource prices;
- Pricing and pollution regulations and their market influence;
- Federal and state incentive regulations and research and development spending; and
- International actions and competition.

The question of how fast the Green Economy is likely to grow is obviously an area of paramount importance to local planners seeking sustainable industry and job growth, as it will do them little good to invest in an enterprise that may never deliver the results they envision. In addition, while there are a number of potential actions federal and state government could take in an effort to account for conventional energy's negative externalities, it seems unwise to anticipate major change in these policies in the near future. This is something planners must take into account when planning for green economic development. Planners must also account for the fact that international competition has a huge effect on renewable energy manufacturing investment. China has aggressively achieved a level of national policy coordination, but such firm decision-making is not likely to happen in the United States.

Based on these factors, economic development planners must also consider which sectors of the Green Economy will prosper in the most likely growth scenarios. Bezdek's work presents three possible growth scenarios (base, moderate, and aggressive) based on a variety of government policy and economic pricing trend factors. Planners would be wise to use the base scenario as a their baseline, as it is the most likely to manifest due to present trends. Bezdek's base scenario argues that investment in energy efficiency (EE) and conservation jobs and industries should be the most attractive option for American cities. In both the base and moderate scenarios the EE sector is projected to generate approximately $2,000 Billion (1,850 in the base and 2,050 for the moderate) while the RE sector is forecasted to generate $100 Billion in the base scenario and $212 Billion in the moderate scenario. This not only confirms the relative sizes of the two sectors but also the greater dependably of the EE sector.

Perhaps the most central conclusion is that an approach like Oakland's, that emphasizes job creation based on conservation and energy efficiency, is one of the safest and most consistent ways for cities to stimulate local growth. Because these jobs are labor-intensive and must be performed locally, they are much less vulnerable to international competition, outsourcing, or business relocation. This is especially important for a city like Oakland seeking to revitalize its struggling downtown and to enact policies that

encourage job growth among people with barriers to employment. These jobs are less vulnerable than those that aim to export goods in competition with the international market, where other economies such as China are likely to dominate.

Another lesson that stands out as after analyzing the case study cities is the necessity of forming partnerships that go beyond traditional or isolated models and methods. The successes experienced in each city were the result of going beyond traditional economic development approaches, such as a student pursuing a degree from a community college or a city competing for a relocating company. The more successful models identify specific goals they wish to advance, form partnerships between local government, non profit organizations, and business, or form new organizations involving all of these players, for the express purpose of furthering their goal. The success of the University of Toledo's Clean and Alternative Energy Incubator, and the $85.7 million of economic impact its graduates have achieved as of October 2010 (UToledo, 2011) is a prime example of this type of success story.

Austin's example also illustrates the pitfalls of inefficiencies that can arise from an sustainable economic development strategy that fails to take advantage of some of the demand created by sustainable portfolio utility requirements. These actions have increased demand, but policies that demand is met by local producers have not been adopted. A regulation such as a mandate that a certain percentage of renewable energy be from locally-generated sources is a missed opportunity to develop the local Green Economy. In addition, while the partnership between the University of Texas and the City of Austin illustrated by such programs as the Austin Technology Incubator have helped over 200 companies raise over $750 million in investor capital (Austin Technology Incubator, 2011), the Brookings Institute ranks Austin's Green Economy as a disappointing 36th largest Green Economy in the United States. (Muro, Rothwell, and Saha, 2011)

It is difficult to calculate the time line for the moment when renewable energy becomes competitive purely on price point with conventional energy until the negative

externalities are accounted for. We know that this will not occur based purely on market mechanisms, but that the market will be shaped and its scope determined based on government intervention and regulation. This is likely to occur when our societal and environmental values and concerns outweigh our political inertia. What the most current available data, reports, and news stories lead me to conclude is that investment is a winning idea for cities because of the certainty that the Green Economy will continue to grow at a much higher rate than the economy in general and that the income will remain higher than average. The big questions for the planning community in the U.S. will be what is the proper role, what will be politically possible, and what scale must be achieved in order to realize the targeted goals? How those questions are answered will tell the story of the near future of sustainable economic development in the United States.

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